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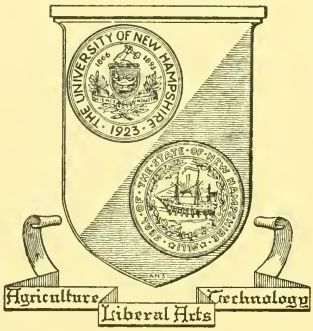

The University
of
New Hampshire

Bulletin 446 September 1957

THE UNIVERSITY OF NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION

Department of Agricultural and Biological Chemistry

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

STATE DEPARTMENT OF AGRICULTURE

H. A. Davis and Ruth Fowler

THE UNIVERSITY OF NEW HAMPSHIRE
DURHAM, N. H.

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

STATE DEPARTMENT OF AGRICULTURE

This bulletin reports the analysis of 173 official samples of commercial fertilizers and fertilizer materials submitted for analysis during the year ending June 30, 1957.

The inspection of commercial fertilizers was made under the direction of the Honorable Perley I. Fitts, Commissioner of Agriculture. The samples were collected by Mr. George H. Laramie, Fertilizer Control Supervisor.

All questions relating to the New Hampshire Fertilizer Law and the registration of fertilizers or fertilizer materials prior to sale in the state, should be directed to the attention of the Fertilizer Control Supervisor, State House, Concord, New Hampshire. This laboratory is responsible for the analysis only of official samples as submitted.

The general character of the fertilizer and fertilizer materials sampled is shown by the following classification.

Complete fertilizer	108
(Of these, 35 also carried a total Magnesium Oxide guarantee and 12 specified water-soluble Magnesium Oxide.)	
Phosphoric acid and potash	22
(Of these, 6 carried a boron guarantee in addition.)	
Nitrogen	3
Nitrogen and phosphoric acid	4
Superphosphate	9
Ammonium Nitrate	2
Milorganite	1
Urea	1
Ground Bone	5
Manure	17
Nitrogen Solution	1

Note: Roger Woodhead assisted with chemical analysis.

THE FERTILIZER LAW

All persons concerned with the manufacture, distribution or use of commercial fertilizers should acquaint themselves with the New Hampshire Commercial Fertilizer Law. A booklet titled "New Hampshire Fertilizer Law and Rules and Regulations," may be obtained by writing the State Department of Agriculture, State House, Concord, New Hampshire.

Quotation from the law concerning **registration, guarantee** and **labeling** of Commercial Fertilizers in New Hampshire follows:

Sec. 4: Registration. (a) Each brand and grade of commercial fertilizer shall be registered before being offered for sale, sold or distributed in this state. The application for registration shall be submitted to the commissioner on forms furnished by the commissioner, and shall be accompanied by a fee, per brand, as follows: ten dollars for the phosphoric acid, ten dollars for the nitrogen, ten dollars for the potash, and ten dollars for the magnesium oxide, or other plant food elements, compounds or classes of compounds; contained or claimed to be in the said brand of fertilizer; but the fee for any brand shall not exceed twenty-five dollars. All registrations expire on or before Janary 1, annually. The application shall include the following information in the following order: (1) The name and address of the person guaranteeing the fertilizer. (2) The brand and grade. (3) The guaranteed analysis showing the minimum percentage of plant food claimed in the following order and form: Total nitrogen ..... per cent; available phosphoric acid ..... per cent; soluble potash ..... per cent; unacidulated mineral phosphatic materials and basic slag shall be guaranteed as to both total and available phosphoric acid, and the degree of fineness. In the case of bone, tankage, and other natural organic phosphate

materials, only the total phosphoric acid need be guaranteed. Additional plant food elements, determinable by chemical methods, may be guaranteed only by permission of the commissioner by and with the advice of the director of the agricultural experiment station. When any such additional plant foods are claimed, they shall be included in the guarantee, and shall be subject to inspection and analysis in accordance with the methods and regulations that may be prescribed by the commissioner.

(b) A distributor shall not be required to register any brand of commercial fertilizer which is already registered hereunder by another person.

(c) The plant food content of each and every brand of commercial fertilizer must remain uniform for the period of registration.

Sec. 5: Labeling. (a) Any commercial fertilizer offered for sale or sold or distributed in this state in bags, barrels, or other containers shall have placed on or affixed to the container in written or printed form the net weight and the information required. (1), (2) and (3) of paragraph (a) of section 4 either (1) on tags affixed to the end of the package between the ears and/or on the sewed end or (2) directly on the package. (b) If distributed in bulk, a written or printed statement of the weight and the information required by (1), (2) and (3) of paragraph (a) of section 4 shall accompany delivery and be supplied to the purchaser.

Penalty provisions — The Law provides for the levying of a penalty amounting to three times the commercial value of the constituent found deficient when deficiencies exceeding allowed tolerances are found. The following table of tolerances as adopted by the State Department of Agriculture is quoted from the Rules and Regulations of that Department.

Total Nitrogen		Available Phosphoric Acid		Soluble Potash	
Guarantee	Deficiency	Guarantee	Deficiency	Guarantee	Deficiency
2%	0.20	0-10% inc.	0.40	2%	0.20
3%	0.25	10-25% inc.	0.50	3%	0.30
4%	0.35	Over 25%	0.75	4%	0.40
5-8% inc.	0.40			4-8% inc.	0.50
8-30% inc.	0.50			8-20% inc.	0.60
Over 30%	0.75			Over 20%	1.00

The chief purpose of the official inspection of fertilizers is to protect the consumer against misbranded products that probably would soon appear on the market if the sale of fertilizer was not under state regulation. If the consumer accepts fertilizer not labeled in compliance with the law, he does so at his own risk. He should acquaint himself with the requirements of the law concerning labeling and be familiar with the terms and symbols used on the label.

A commercial fertilizer generally supplies one or more of three elements: nitrogen, phosphorus and potassium; which are commonly required in relatively large amounts for plant growth. The percentage of each of these three materials is usually represented by numerals in designating the grade of a fertilizer. These percentages are presently expressed in terms of nitrogen, phosphorus pentoxide and potash and the symbols used are N, P_2O_5 and K_2O respectively. The term phosphoric acid is commonly used when referring to the phosphorus content.

Under certain conditions, other elements such as magnesium, boron and other so-called minor elements are needed to correct soil deficiencies in certain localities. These may be included in the mixed fertilizer.

Much advertising of fertilizer materials packed in small packages is directed to the attention of the home gardener and growers of house plants. This small package serves a definite need, however the "miracle" results claimed may not always be obtained. In general, it is more economical for the gardener to purchase fertilizer of a reliable brand and in reasonably large packages.

All control officials charged with the enforcement of state laws regulating the sale of commercial fertilizers and fertilizer materials are joined in the Association of American Fertilizer Control Officials. Research workers employed by State or Federal Agencies engaged in the investigation of fertilizers are also members of this Association. The object of this organization is to "promote

uniform and effective legislation, definitions, rulings, and enforcement of laws relating to the control of sale and distribution of mixed fertilizers and fertilizer materials in the Continent of North America. At the annual meetings of the Association, reports and recommendations of investigators concerning definitions of fertilizer materials, use of new products, and problems concerning regulation of the fertilizer trade are discussed in detail. Fertilizer manufacturers are invited to participate in these discussions and through mutual co-operation, the farmer is supplied with a product that can be relied upon to do the job expected in crop production. The official publication of the Association may be obtained for a small fee through the office of its secretary, B. D. Cloaninger, Clemson, South Carolina. This booklet contains the official terms describing fertilizer materials, a proposed model state fertilizer law, as well as the proceedings of the annual meeting.

Whether or not a fertilizer contains the guaranteed amount of plant food can be determined only by a chemical analysis. For this reason, it is considered necessary that each brand of fertilizer offered for sale be officially sampled and analyzed each year. When failure to meet the guarantee is proved by chemical analysis, the prosecution or seizure provisions of the law may be invoked. The purchaser's refusal to buy a fertilizer which does not conform to the law will not only assist in the enforcement of the law, but will at the same time insure him the protection of the law.

Control officials are giving the matter of excessive ash in sheep and cattle manure samples their attention. Total ash was determined in each of the 17 samples of dried manure drawn this year. The percent ash found varied from 11.9% to 74.0%. Eleven of the samples had excessive ash content. Excessive ash content is indicated when the amount is over 30% and adulteration with sand or "dirt" is likely. Even with high ash content the guarantees are usually met because the amount of plant food in manures is relatively small. The point is that manures are bought to supply a considerable amount of organic matter. A high ash content indicates a relatively low organic matter content. This problem is being given special attention by New England control officials and it is expected that some specific recommendations will be presented before the Association of Fertilizer Control Officials in the near future.

USE OF COMMERCIAL FERTILIZERS

It is not within the scope of this department to make recommendations regarding the use of commercial fertilizers. The Department of Agronomy and the Department of Agricultural and Biological Chemistry of the University of New Hampshire Agricultural Experiment Station test soils and conduct experimental work with various fertilizer materials on hay and crop land. The Department of Horticulture investigates fertilizer treatments for fruits and vegetables. Much of this work has been published, and is available for free distribution to residents of New Hampshire. Address your request to Mail Service, University of New Hampshire, Durham, New Hampshire. A list of currently available publications on fertilization follows:

Ext. Bull.	100	Growing Apples in New Hampshire.
Ext. Bull.	104	Growing Vegetables at Home.
Ext. Bull.	105	Asparagus in New Hampshire.
Ext. Bull.	118	Growing Potatoes in New Hampshire.
Ext. Bull.	125	Growing Strawberries in New Hampshire.
Ext. Bull.	129	Forage Crop Production in New Hampshire.
Ext. Bull.	130	Care of the Established Lawn.
Ext. Cir.	275	Culture of Low-Bush Blueberries.
Ext. Cir.	309	Growing Grapes in New Hampshire.
Ext. Cir.	310	Cane Fruit Culture.
Ext. Cir.	314	Tomatoes for New Hampshire.
Sta. Bull.	324	Experiment with Potatoes.
Sta. Bull.	424	Soils and Their Crop Adaptation in New Hampshire.
Sta. Bull.	439	Forage Variety Trials in New Hampshire 1951-1956.
Folder		New Hampshire Recommendations for Seed, Fertilizer and Lime.

While the word "fertilizer" does not appear in all of the above titles, none is included which does not discuss the use of fertilizer.

CONFORMITY OF GUARANTEE

The chemical analyses reported in this bulletin were made by the methods adopted by the Association of Official Agricultural Chemists. The following list indicates the number of samples equaling or failing to meet guarantee:

Number of samples analyzed	173
Equalling or exceeding all guarantees	96
Deficient in nitrogen only	39
(9 subject to penalty)	
Deficient in phosphoric acid only	11
(2 subject to penalty)	
Deficient in potash	10
(6 subject to penalty)	
Deficient in nitrogen and phosphoric acid	5
(2 subject to penalty in both)	
(1 subject to penalty in nitrogen)	
(2 subject to penalty in phosphoric acid)	
Deficient in nitrogen and potash	5
(1 subject to penalty in both)	
(2 subject to penalty in potash)	
Deficient in phosphoric acid and potash	3
Deficient in nitrogen, phosphoric acid and potash	4
(1 subject to penalty in nitrogen and potash)	
(1 subject to penalty in potash)	

Thirty-five samples were guaranteed to contain magnesium oxide. Of these, twelve indicated the guarantee in terms of water soluble magnesium oxide. In these cases total magnesium oxide was not determined. With the exception of two brands that were found slightly deficient all met the magnesium oxide guarantee.

Penalties were assessed on 27 different lots of fertilizers representing 11 grades. Three grades, 0-15-30, 8-16-16, and 10-10-10 were involved in 17 of the lots assessed. The others were scattering, one or two only of a particular grade. The penalty clause was invoked in fourteen cases for nitrogen, six cases for phosphoric acid and eleven cases for potash shortages. These cases are noted in the table of analyses by bold type and by underline. The manufacturers are listed alphabetically and the brand names by formula and alphabetically under the name of the manufacturer.

There are far too many small deficiencies as shown by the fact that only 96 out of 173 samples met all guarantees. This problem is of serious concern and considerable co-operative work is underway to solve the problem. Fertilizers are largely mixtures of chemicals. Segregation of these materials in the bag is difficult to prevent. Modern methods of fertilizer manufacture are doing much to process the fertilizer in such a way that segregation will be avoided. The solution of this problem is difficult. To obtain a truly representative sample of a fertilizer mixture requires careful work. The chemist can accurately determine the nitrogen, phosphoric acid, and potash content of the sample sent to the laboratory. If this sample does not correctly represent the larger lot, the analytical work is of no use. The obligation of the fertilizer control program is to see that the manufacturer is supplying the guaranteed amount of plant food to the consumer. For this reason, the sample must be drawn and analyzed very carefully so that injustice will not be done to either the consumer or manufacturer.

COMMERCIAL VALUE OF FERTILIZERS

Section 10 of the New Hampshire Fertilizer Law of 1955, states "For the purpose of determining the commercial values to be applied under the provisions of Section 7, the Commission shall determine and publish annually, the values per pound of nitrogen, phosphoric acid and potash in commercial fertilizers in this state. The values so determined and published shall be used in determining and assessing penalties."

After consulting the fertilizer manufacturers selling the major tonnage of fertilizer in New Hampshire, the Commissioner established and the Agricultural Advisory Board approved on March 18, 1957, the following commercial values per pound of nitrogen, phosphoric acid and potash:

$3.00 per Unit or 15¢ per pound of Nitrogen.
$2.00 per Unit or 10¢ per pound of Phosphoric Acid.
$1.20 per Unit or 6¢ per pound of Potash.

March 19, 1957
The New Hampshire Department of Agriculture
Concord, New Hampshire

Manufacturer and Brand	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Agricutural Products Co. W. Kingston, R. I.											
* Meadow Brand Sheep Manure	Nashua	1.40	1.72	0.35	0.35	.....	.....	2.00	4.20	.....	.....
Allied Chemical & Dye Corp., Nitrogen Div. Hopewell, Virginia											
(F) Arcadian Urea 45 Fertilizer Compound	Brentwood	45.00	45.44	.....	.....	.....	.....	.....	.....	.....	.....
(F) Arcadian Uran Solution	Westmoreland	30.00	30.0	.....	.....	.....	.....	.....	.....	.....	.....
American Agriclutural Chemical Co. N. Weymouth, Mass.											
(F) AA Fertilizer 0-15-30	Canterbury	.....	.....	.....	15.10	15.00	15.00	30.00	**27.36**	.....	.....
(F) AA Fertilizer 0-15-30	Contoocook	.....	.....	.....	14.81	15.00	14.73	30.00	29.12	.....	.....
(F) AA Fertilizer 0-20-20	Laconia	.....	.....	.....	20.75	20.00	20.47	20.00	20.75	.....	.....
AA Fertilizer 0-20-20	Plymouth	.....	.....	.....	19.87	20.00	19.61	20.00	20.86	.....	.....
(F) AA Fertilizer 5-10-10	Stewartstown	5.00	5.11	.....	10.56	10.00	9.88	10.00	10.44	2.00	2.40
(F) AA Fertilizer 5-10-10-2	Laconia	5.00	5.30	.....	10.62	10.00	10.00	10.00	10.68	2.00	2.39
(F) AA Fertilizer 8-16-16	Canterbury	8.00	8.04	.....	16.30	16.00	16.00	16.00	16.24	.....	.....
(F) AA Fertilizer 8-16-16	Contoocook	8.00	8.15	.....	15.92	16.00	15.60	16.00	16.08	.....	.....
(F) AA Fertilizer 8-16-16	Benton	8.00	8.00	.....	16.46	16.00	16.09	16.00	16.80	.....	.....
(F) AA Fertilizer 8-16-16	Laconia	8.00	8.03	.....	16.44	16.00	16.01	16.00	16.56	.....	.....
(F) AA Fertilizer 8-16-16	Manchester	8.00	7.78	.....	15.71	16.00	**15.40**	16.00	16.80	.....	.....
(F) AA Fertilizer 10-10-10	Contoocook	10.00	10.09	.....	10.54	10.00	10.32	10.00	10.72	.....	.....
(F) AA Quality 5-10-10-2 Fertilizer	Concord	5.00	5.17	.....	10.35	10.00	9.70	10.00	10.46	2.00	2.49
Agrico Country Club Fertilizer 8-6-4	Littleton	8.00	7.71	.....	6.64	6.00	6.39	4.00	4.30	.....	.....

Agrico for New England 5-8-7	Lebanon	5.00	5.48	.....	10.28	8.00	9.87	7.00	7.50	.....	.....
Agrico for New England 5-8-7	Plymouth	5.00	4.85	.....	8.66	8.00	8.17	7.00	7.44	.....	.....
(F) Agrico for New England 8-12-12	Lancaster	8.00	8.00	.....	12.41	12.00	12.01	12.00	12.16	2.00	2.07
Agrico for Potatoes 5-10-10-2	Lancaster	5.00	5.03	.....	10.30	10.00	10.00	10.00	10.44	2.00	2.27
Agrico Pulverized Sheep Manure	Portsmouth	1.25	1.43	1.00	1.60	.....	.....	2.00	4.28	.....	.....
Agrico Top Dressing 7-7-7	Lebanon	7.00	7.00	.....	7.68	7.00	7.45	7.00	7.32	.....	.....
Agrico Top Dressing 7-7-7	Plymouth	7.00	6.86	.....	7.15	7.00	7.02	7.00	7.36	.....	.....
Agrinite 7-0-0	Portsmouth	7.00	8.77	.....	.....	.....	.....	.....	.....	.....	.....
Bone Meal	Portsmouth	1.50	2.72	25.00	27.75	.....	.....	.....	.....	.....	.....
18% Normal Superphosphate	Lebanon	.....	.....	.....	18.62	18.00	18.19	.....	.....	.....	.....
American Cyanamid Co. New York 20, N. Y.											
(F) Aeroprills-Ammonium Nitrate Fertilizer	Concord	33.50	33.6	.....	.....	.....	.....	.....	.....	.....	.....
(F) Aeroprills-Ammonium Nitrate Fertilizer	Concord	33.50	33.5	.....	.....	.....	.....	.....	.....	.....	.....
Armour Fertilizer Works Carteret, New Jersey											
* Amour All Organic 5-5-0	Keene	5.00	4.75	5.00	5.44	.....	.....	.....	.....	.....	.....
* Armour Big Crop Fertilizer 7-7-7	Keene	7.00	6.67	.....	8.62	7.00	8.38	7.00	7.36	.....	.....
Armour Big Crop Fertilizer 8-16-16	Keene	8. 00	7.92	.....	16.40	16.00	16.28	16.00	16.64	.....	.....
Armour Big Crop Fertilizer 10-10-10	Keene	10.00	**9.30**	.....	10.96	10.00	10.68	10.00	10.20	.....	.....
Armour Bone Meal	Keene	2.30	3.29	23.0	26.95	.....	.....	.....	.....	.....	.....
Armour Pulverized Sheep Manure	Keene	1.25	1.26	1.00	2.05	.....	.....	2.00	3.84	.....	.....
* Armour Shredded Cattle Manure	Keene	2.00	2.24	1.00	1.03	.....	.....	2.00	2.35	.....	.....
Armour Vertagreen Complete Plant Food	Keene	5.00	5.11	.....	11.69	10.00	10.32	5.00	5.50	.....	.....
(F) Armour Vertagreen Plant Food 6-12-12	Brentwood	6.00	**5.58**	.....	13.04	12.00	12.15	12.00	12.40	.....	.....
Armour Vertagreen 10-6-4 Plant Food	Keene	10.00	10.00	.....	6.68	6.00	6.13	4.00	4.88	.....	.....
Joseph Breck & Sons Boston 10, Mass.											
Breck's Turf Gro 8-6-2	Nashua	8.00	7.78	.....	6.90	6.00	6.38	2.00	**1.78**	.....	.....

* Not registered when sampled.
(F) Sampled at a farm.

Manufacturer and Brand	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Buell Fertilizer Co. Exeter, N. H.											
* Buell Peal Poultry Manure	Manchester	3.00	3.40	3.00	4.23	.....	.....	1.50	2.86	.....	.....
Chicago Stock Yards Compost Co. Chicago 9, Ill.											
* Gardenure Rotted Cow Manure Compost	Nashua	1.00	1.46	1.00	1.28	.....	.....	1.00	2.01	.....	.....
Clinton Nurseries Clinton, Conn.											
* New Era Cow Manure	Berlin	2.00	**1.12**	1.00	0.71	.....	.....	1.00	1.75	.....	.....
Consolidated Rendering Co. Boston, Mass.											
(F) Corenco Fertilizer 0-15-30	Colebrook	.....	.....	.....	15.21	15.00	15.00	30.00	**28.56**	.....	.....
Corenco 5-8-7 Potato and General Crop	Lancaster	5.00	4.80	.....	9.12	8.00	8.74	7.00	7.92	.....	.....
Corenco 5-10-10-2	Lancaster	5.00	5.18	.....	10.40	10.00	10.02	10.00	10.68	2.00+	2.10+
Corenco 8-16-16 Two in One	Conway	8.00	7.66	.....	16.96	16.00	16.26	16.00	15.68	.....	.....
* Corenco 10-10-10-2 Complete Fruit and Top Dressing	Conway	10.00	10.05	.....	10.40	10.00	10.01	10.00	9.52	2.00	2.18
Corenco Fertilizer 5-10-10	Lancaster	5.00	5.21	.....	10.98	10.00	10.68	10.00	10.52	.....	.....
(F) Corenco Fertilizer 7-7-7	Lebanon	7.00	7.08	.....	7.80	7.00	7.60	7.00	7.88	.....	.....
Corenco Fertilizer 7-7-7	Nashua	7.00	7.13	.....	8.12	7.00	7.95	7.00	7.14	.....	.....
Corenco Fertilizer 8-16-16	Berlin	8.00	7.78	.....	16.31	16.00	15.56	16.00	15.76	.....	.....
(F) *Corenco Fertilizer 10-10-10 50% organic	Thornton's Fy.	10.00	9.56	.....	10.20	10.00	10.08	10.00	10.40	.....	.....
(F) Corenco Fertilizer 10-10-10 50% organic	Thornton's Fy.	10.00	9.52	.....	10.38	10.00	10.18	10.00	10.60	.....	.....

(F) Corenco Fertilizer Superphosphate 20%	Tilton	.....	.....	.....	21.25	20.00	21.22	.....	.....	.....	.....
Corenco Sheep Manure	Plymouth	1.25	1.40	1.00	1.64	.....	.....	2.00	4.45	.....	.....
(F) Corenco Superphosphate 20%	Dover	.....	.....	.....	20.85	20.00	20.75	.....	.....	.....	.....
(F) Corenco Superphosphate 20%	Gerrish	.....	.....	.....	20.80	20.00	20.76	.....	.....	.....	.....
(F) *Corenco Triple Superphosphate 46%	Durham	.....	.....	.....	47.20	46.00	46.10	.....	.....	.....	.....
Eastern States Farmers Exchange, Inc. W. Springfield, Mass.											
(F) [1]Eastern States Fertilizer 0-15-30 with Boron	Canterbury	.....	.....	.....	17.48	15.00	17.13	30.00	**28.00**	.....	.....
(F) [2]Eastern States Fertilizer 0-15-30 with Boron	Warner	.....	.....	.....	17.64	15.00	17.31	30.00	29.63	.....	.....
(F) [3]Eastern States Fertilizer 0-15-30 with Boron	N. Haverhill	.....	.....	.....	15.64	15.00	15.37	30.00	30.50	.....	.....
(F) [4]Eastern States Fertilizer 0-15-30 with Boron	Woodsville	.....	.....	.....	16.16	15.00	15.57	30.00	29.28	.....	.....
(F) Eastern States Fertilizer 0-25-25	Dover	.....	.....	.....	26.25	25.00	26.03	25.00	25.20	.....	.....
(F) Eastern States Fertilizer 5-10-10-2	Laconia	5.00	5.62	.....	10.80	10.00	10.39	10.00	11.60	2.00	3.25
(F) Eastern States Fertilizer 8-12-12 LC	Brentwood	8.00	8.74	.....	12.28	12.00	12.09	12.00	12.72	2.00+	2.59+
(F) Eastern States Fertilizer 8-16-16	Canterbury	8.00	7.91	.....	17.12	16.00	16.60	16.00	16.56	1.00	1.72
(F) Eastern States Fertilizer 8-16-16	Warner	8.00	8.41	.....	16.34	16.00	16.08	16.00	16.56	1.00	1.29
(F) Eastern States Fertilizer 8-16-16	Bradford	8.00	8.00	.....	16.34	16.00	16.16	16.00	16.00	1.00	2.34
(F) Eastern States Fertilizer 8-16-16	Henniker	8.00	7.91	.....	16.98	16.00	16.61	16.00	16.88	1.00	1.44
(F) Eastern States Fertilizer 8-16-16	Dover	8.00	7.88	.....	17.18	16.00	17.00	16.00	16.10	1.00+	1.23+
(F) Eastern States Fertilizer 8-16-16	Woodsville	8.00	**7.28**	.....	16.92	16.00	16.58	16.00	18.08	.....	.....
(F) Eastern States Fertilizer 8-16-16-1	Ossipee	8.00	8.01	.....	17.08	16.00	16.68	16.00	16.82	1.00+	1.25+
(F) Eastern States Fertilizer 10-10-10	N. Haverhill	10.00	10.61	.....	10.44	10.00	10.28	10.00	10.42	1.00+	0.67+
(F) Eastern States Fertilizer 10-10-10-1	Tilton	10.00	10.00	.....	10.50	10.00	10.37	10.00	10.20	1.00	1.78
(F) Eastern States Fertilizer 10-10-10-1	Ossipee	10.00	10.67	.....	10.58	10.00	10.30	10.00	10.52	1.00	1.89
Eastern States Green Lawn 10-5-5	Manchester	10.00	10.23	.....	5.60	5.00	5.49	5.00	6.30	.....	.....
Faesy & Besthoff, Inc. New York 13, N. Y.											
F & B Pure Steamed Bone Meal	Portsmouth	2.47	2.75	23.00	26.50	.....	.....	.....	.....	.....	.....

(F) Sampled at a farm.
\+ Water Soluble MgO.
* Not registered when sampled.

1 Boron Guaranteed 0.20%; Boron Found 0.24%.
2 Boron Guaranteed 0.20%; Boron Found 0.25%.
3 Boron Guaranteed 0.20%; Boron Found 0.31%.
4 Boron Guaranteed 0.20%; Boron Found 0.30%.

Manufacturer and Brand	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Glorion; Division of Aluminum & Chemical Corp. Greenwich, Conn.											
Glorion 4-8-8	Portsmouth	4.00	4.53	.....	9.60	8.00	8.30	8.00	8.88	.....	.....
Glorion 4-8-8	Meredith	4.00	4.62	.....	9.29	8.00	7.88	8.00	8.78	.....	.....
A. H. Hoffman, Inc. Landisville, Pa.											
Hoffman Cow Manure	N. Conway	2.00	2.10	1.00	1.63	.....	.....	1.00	2.84	.....	.....
Hoffman Sheep Manure	N. Conway	1.25	1.36	1.00	1.29	.....	.....	2.00	4.15	.....	.....
Hubbard Hall Chemical Co. Waterbury, Conn.											
(F) *[5]Hubbard Hall 0-15-30 with Boron ..	Concord	.....	.....	.....	15.34	15.00	15.01	30.00	30.32	.....	.....
(F) *[6]Hubbard Hall 0-15-30 with Boron ..	Concord	.....	.....	.....	15.07	15.00	14.88	30.00	29.52	.....	.....
(F) Liberty Fertilizer 0-15-30	Manchester	.....	.....	.....	15.46	15.00	15.21	30.00	30.04	.....	.....
International Minerals & Chemicals Corp. Woburn, Mass.											
Fertilis Plant Food 8-6-2-1	Manchester	8.00	7.61	.....	6.72	6.00	6.26	2.00	2.84	1.00+	2.55+
(F) *International Fertilizer 0-15-30	Benton	.....	.....	.....	15.10	15.00	14.72	30.00	29.46	.....	.....
International Fertilizer 0-15-30	W. Lebanon	.....	.....	.....	15.18	15.00	15.00	30.00	30.60	.....	.....
(F) International Fertilizer 0-15-30	Bath	.....	.....	.....	15.54	15.00	15.12	30.00	**28.40**	.....	.....
(F) *International Fertilizer 0-20-20	Lee	.....	.....	.....	21.05	20.00	20.66	20.00	20.00	.....	.....
(F) *International Fertilizer 0-20-20	Contoocook	.....	.....	.....	20.75	20.00	20.41	20.00	20.05	.....	.....
International Fertilizer 5-8-7-1	Meredith	5.00	5.02	.....	8.38	8.00	8.00	7.00	7.04	1.00	2.09
(F) International Fertilizer 5-10-10-2	Brentwood	5.00	5.03	.....	10.28	10.00	10.00	10.00	10.44	2.00+	2.16+
International Fertilizer 5-10-10-2 Potato with Sul-Po-Mag	W. Lebanon	5.00	5.02	.....	10.74	10.00	10.34	10.00	10.08	2.00+	2.23+

International Fertilzer 7-7-7-1	W. Lebanon	7.00	7.05	.....	7.60	7.00	7.37	7.00	7.00	1.00	2.05
(F) International Fertilizer 8-16-16	Contoocook	8.00	7.71	.....	17.40	16.00	16.78	16.00	16.48	.....	.....
International Fertilizer 8-16-16	W. Lebanon	8.00	7.79	.....	16.64	16.00	16.14	16.00	15.84	.....	.....
(F) International Fertilizer 8-16-16	Brentwood	8.00	7.74	.....	17.00	16.00	16.32	16.00	16.34	.....	.....
(F) International Fertilizer 8-16-16	Bath	8.00	7.63	.....	17.44	16.00	16.77	16.00	16.32	.....	.....
(F) International Fertilizer 8-16-16	Colebrook	8.00	7.62	.....	16.74	16.00	16.15	16.00	16.08	.....	.....
(F) International Fertilizer 10-10-10-1	Benton	10.00	9.78	.....	10.28	10.00	10.00	10.00	10.05	1.00	1.53
International Fertilizer 10-10-10-1	Lebanon	10.00	9.78	.....	10.58	10.00	10.34	10.00	10.21	1.00	1.12
(F) International Fertilizer 10-10-10-1	Brentwood	10.00	9.52	.....	10.50	10.00	10.19	10.00	10.20	1.00	1.40
(F) International Fertilizer Superphosphate 20%	Benton	.....	.....	.....	20.20	20.00	20.02	.....	.....	.....	.....
International Rainbow 6-12-12-2	Manchester	6.00	5.31	.....	12.94	12.00	12.55	12.00	12.36	2.00+	2.51+
(F) International Rainbow 8-12-12-2	Brentwood	8.00	7.70	.....	12.44	12.00	12.09	12.00	12.20	2.00+	2.36+
(F) International Rainbow 8-12-12-2	Colebrook	8.00	7.63	.....	12.90	12.00	12.54	12.00	12.08	2.00+	2.50+
(F) International Rainbow 10-10-10-5	Derry	10.00	9.10	.....	11.04	10.00	10.88	10.00	10.68	5.00+	4.62+
(F) International 20% Superphosphate	Concord	.....	.....	.....	19.92	20.00	19.60	.....	.....	.....	.....
(F) International 20% Superphosphate	Laconia	.....	.....	.....	21.15	20.00	20.90	.....	.....	.....	.....
Mello-Green	Manchester	5.00	5.02	.....	5.72	4.00	5.38	.....	.....	.....	.....
Mello-Green 5-4-0	Lebanon	5.00	5.53	.....	7.86	4.00	7.28	.....	.....	.....	.....
Lawn Tex, Inc. Chicago, Ill.											
Organi-Green	Manchester	5.00	4.34	.....	4.69	5.00	4.04	.....	.....	.....	.....
Merrimack Farmers' Exchange, Inc. Concord, N. H.											
(F) Merrimack Fertilizer 0-15-30	E. Haverhill	.....	.....	.....	15.24	15.00	15.00	30.00	29.01	.....	.....
Merrimack Fertilizer 5-8-7	Plymouth	5.00	5.62	.....	9.24	8.00	8.73	7.00	7.74	.....	.....
Merrimack Fertilizer 5-10-10	Plymouth	5.00	5.13	.....	10.50	10.00	10.02	10.00	10.68	.....	.....
(F) Merrimack Fertilizer 5-10-10	Unity	5.00	5.04	.....	10.42	10.00	10.02	10.00	10.36	.....	.....
Merrimack Fertilizer 7-7-7	Plymouth	7.00	7.10	.....	7.56	7.00	7.39	7.00	7.32	.....	.....
(F) Merrimack Fertilizer 8-16-16	Henniker	8.00	8.17	.....	15.88	16.00	15.61	16.00	16.75	.....	.....
(F) Merrimack Fertilizer 8-16-16	Bedford	8.00	8.20	.....	15.91	16.00	15.25	16.00	16.64	.....	.....
(F) Merrimack Fertilizer 8-16-16	Tilton	8.00	7.79	.....	17.72	16.00	17.05	16.00	14.84	.....	.....
(F) Merrimack Fertilizer 8-16-16	Tilton	8.00	6.90	.....	16.01	16.00	15.51	16.00	13.28	.....	.....
Merrimack Fertilizer 8-16-16	Plymouth	8.00	8.03	.....	16.25	16.00	15.53	16.00	16.60	.....	.....

* Not registered when sampled.
(F) Sampled at a farm.
\+ Water Soluble MgO.

5 Boron Guaranteed 0.56%; Boron Found 0.63%.
6 Boron Guaranteed 0.56%; Boron Found 0.64%.

Manufacturer and Brand	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Merrimack Farmers' Exchange, Inc. Concord, N. H. (Continued)											
(F) Merrimack Fertilizer 8-16-16	Gerrish	8.00	7.86	.....	15.98	16.00	15.54	16.00	**15.08**	.....	.....
(F) Merrimack Fertilizer 8-16-16	E. Haverhill	8.00	8.06	.....	15.54	16.00	**15.02**	16.00	16.94	.....	.....
(F) Merrimack Fertilizer 8-16-16	Unity	8.00	8.00	.....	16.68	16.00	16.00	16.00	16.56	.....	.....
(F) Merrimack Fertilizer 10-10-10	Bedford	10.00	**9.34**	.....	10.46	10.00	10.09	10.00	10.40	.....	.....
(F) Merrimack Fertilizer 10-10-10	Unity	10.00	9.68	.....	10.88	10.00	10.42	10.00	10.52	.....	.....
Merrimack Turf Green 8-6-4	Plymouth	8.00	8.07	.....	6.32	6.00	6.00	4.00	4.84	.....	.....
Natural Plant Food Co. Okla, City, Okla.											
Longhorn Brand Cattle Manure	Manchester	2.00	2.03	1.00	1.00	.....	.....	2.00	**1.75**	.....	.....
Ramshorn Brand Sheep Manure	Manchester	2.00	**1.67**	1.00	1.00	.....	.....	2.00	**1.62**	.....	.....
Old Deerfield Fertilizer Co., Inc. South Deerfield, Mass.											
(F) *Old Deerfield 8-16-16 Fertilizer	Concord	8.00	8.16	.....	16.90	16.00	16.45	16.00	16.56	.....	.....
(F) *Old Deerfield 8-16-16 Fertilizer	Concord	8.00	8.24	.....	17.24	16.00	16.58	16.00	16.26	.....	.....
Old Fox Agricultural Sales, Inc. E. Providence, R. I.											
(F) Old Fox Fertilizer 0-15-30	Durham	.....	.....	.....	15.52	15.00	15.34	30.00	30.85	.....	.....
(F) *Old Fox Fertilizer 0-20-20	Barrington	.....	.....	.....	20.40	20.00	20.23	20.00	20.24	.....	.....
Old Fox Fertilizer 0-20-20	Dover	.....	.....	.....	20.30	20.00	20.09	20.00	20.48	.....	.....
Old Fox Fertilizer 5-10-10	Dover	5.00	5.21	.....	10.48	10.00	10.00	10.00	10.18	.....	.....
(F) Old Fox Fertilizer 5-10-10	Durham	5.00	5.14	.....	10.28	10.00	10.01	10.00	10.52	.....	.....
Old Fox Fertilizer 7-7-7	Meredith	7.00	7.23	.....	7.56	7.00	7.11	7.00	7.84	.....	.....
(F) Old Fox Fertilizer 7-7-7	Durham	7.00	7.40	.....	8.70	7.00	8.19	7.00	7.24	.....	.....
Old Fox Fertilizer 8-16-16	Meredith	8.00	7.93	.....	16.88	16.00	16.21	16.00	16.88	.....	.....

(F) Old Fox Fertilizer 8-16-16	Durham	8.00	7.62	.....	16.48	16.00	16.00	16.00	16.80	.....	.....
Old Fox Fertilizer 8-16-16	Walpole	8.00	**7.55**	.....	16.88	16.00	16.26	16.00	16.24	.....	.....
(F) Old Fox Fertilizer 10-10-10	Durham	10.00	10.00	.....	11.08	10.00	10.68	10.00	10.52	.....	.....
Old Fox Fertilizer 10-10-10	Walpole	10.00	9.66	.....	10.92	10.00	10.58	10.00	10.80	.....	.....
(F) Old Fox Fertilizer Superphosphate 20%	Barrington	.....	.....	.....	21.00	20.00	20.54	.....	.....	.....	.....
Old Fox Garden Food 5-10-5	Nashua	5.00	5.23	.....	10.48	10.00	10.00	5.00	5.94	.....	.....
* Old Fox Organo 5-0-0	Nashua	5.00	5.04	.....	.....	.....	.....	.....	.....	.....	.....
Old Fox Turf Food 8-6-2	Nashua	8.00	8.01	.....	7.24	6.00	6.93	2.00	4.24	.....	.....
Rogers & Hubbard Co. Portland, Conn.											
* Gro Fast Bone Meal	Berlin	2.00	2.48	23.00	28.00	.....	.....	.....	.....	.....	.....
* Gro Fast Cow Manure	Berlin	2.00	**1.22**	1.00	1.01	.....	.....	1.00	1.95	.....	.....
* Gro Fast Rose Food 7-10-5	Berlin	7.00	7.23	.....	15.00	10.00	13.13	5.00	**4.48**	.....	.....
* Gro Fast Sheep Manure	Berlin	1.25	1.25	1.00	1.62	.....	.....	2.00	3.98	.....	.....
Sagadahoc Fertilizer Co., Inc. Bowdoinham, Maine											
* Sagadahoc Bone Meal	N. Conway	2.00	2.48	18.00	28.82	.....	.....	.....	.....	.....	.....
(F) Sagadahoc Fertilizer 5-10-10	Northumberland	5.00	4.93	.....	10.72	10.00	9.70	10.00	9.77	2.00	2.61
(F) Sagadahoc Fertilizer 8-12-12	Northumberland	8.00	8.29	.....	13.26	12.00	12.65	12.00	12.88	2.00	2.70
(F) Sagadahoc Fertilizer 8-12-12	Lancaster	8.00	7.84	.....	12.70	12.00	12.11	12.00	12.08	2.00	2.30
(F) Sagadahoc Fertilizer 8-16-16	Lancaster	8.00	7.80	.....	16.10	16.00	**15.45**	16.00	16.16	.....	.....
(F) Sagadahoc Fertilizer 8-16-16	Colebrook	8.00	**7.33**	.....	16.15	16.00	**15.44**	16.00	16.00	2.00	2.96
O. M. Scott & Sons, Inc. Marysville, Ohio											
Scott's Improved Turf Builder 20-10-5	Portsmouth	20.00	**18.10**	.....	12.70	10.00	12.53	5.00	6.02	.....	.....
* Scott's New Weed and Feed	Manchester	25.00	25.82	.....	.....	.....	.....	.....	.....	.....	.....
Scott's Turf Builder 9-7-4	Portsmouth	9.00	9.29	.....	7.36	7.00	7.24	4.00	4.90	.....	.....
Sears Roebuck & Co. Chicago 7, Ill.											
Cross Country Bulb Food	Manchester	4.00	4.04	.....	12.40	12.00	12.02	8.00	10.32	.....	.....
Cross Country Cattle Manure	Manchester	1.50	1.93	0.75	0.92	.....	.....	2.00	2.70	.....	.....

* Not registered when sampled.
(F) Sampled at a farm.

Manufacturer and Brand	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Sears Roebuck & Co. Chicago 7, Ill. (Continued)											
Cross Country Evergreen Food 10-6-4	Manchester	10.00	9.70	.....	7.74	6.00	7.61	4.00	4.36	.....	.....
Cross Country Plant Food 5-10-5	Manchester	5.00	5.09	.....	11.04	10.00	10.43	5.00	5.00	.....	.....
Cross Country Rose Food	Manchester	5.00	5.03	.....	10.78	10.00	10.57	5.00	7.86	.....	.....
Cross Country Sheep Manure	Manchester	1.50	2.12	0.75	1.13	.....	.....	2.00	2.82	.....	.....
Sewerage Commission of Milwaukee Milwaukee, Wis.											
Milorganite	Nashua	5.50	6.05	4.75	4.55	4.00	4.05	.....	.....	.....	.....
Swift & Co. Boston 4, Mass.											
* New Golden Vigoro Complete Lawn Food 6-10-4	Portsmouth	6.00	5.94	.....	10.60	10.00	10.00	4.00	4.32	.....	.....
Vigoro Complete Plant Food 6-10-4	Manchester	6.00	5.92	.....	10.44	10.00	10.00	4.00	4.20	.....	.....
Valley Feed & Supply Spring Valley, N. Y.											
Adorna 3-1-1	Manchester	3.00	4.38	.....	9.52	1.00	4.22	1.00	1.81	.....	.....
Walker-Gordon Lab. Co. Plainsboro, N. J.											
Bovung Dehydrated Cow Manure	Portsmouth	2.00	2.01	1.00	1.63	.....	.....	1.00	2.25	.....	.....

* Not registered when sampled.

The following information was furnished by Control Supervisor.

The following fertilizer products were unregistered with the New Hampshire Department of Agriculture at the time they were exposed for sale. Samples were not drawn.

Clinton Nurseries	Clinton, Conn.
New Era Cow Manure 2-1-2	
New Era Rose Food 5-10-5	
International Minerals & Chemical Corp.	Woburn, Mass.
International Bone Meal 2.47-23-0	
Sears Roebuck & Co.	Chicago 7, Ill.
Cross Country Azalea-Camellia Food 7-7-7	
Victor Chemical Works	Chicago, Ill.
Take Hold Plant Starter 10-52-17	
Consolidated Rendering Co.	Boston, Mass.
Corenco Sheep Manure 2-1-2	
Corenco Rhododendron-Azalea-Blueberry Special 7-7-7	

630.72
N532
no.426-450
DATE DUE

NOV 4 '64	
MAY 19 '65	
Sept 29	
NOV 23 '69	
	F32a